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EDITOR'S COMMENTS

This is the thirtieth quarterly newsletter providing project status updates from the Navigation and Landing Product Team. The Newsletter does not substitute for official correspondence and it is not directive; its function is to provide status on acquisition projects. It will consist primarily of project highlights, working group reports, announcements of upcoming events, and related program information. It is written by engineers and other technical personnel to inform staff offices at FAA Headquarters, the Regions, Centers, Sectors, designated support contractors, and various aviation industry organizations of N&L activities. The information published will be repetitive, but updated with each issue, if required.

Due to delays between cut-off dates for submission of materials and publication, predicted or anticipated activities can be "overtaken by events." Each system featured, however, includes the name and phone number of the technical point of contact who can clarify or update information.

Your comments are welcomed and encouraged; any items you would like to include in the June Newsletter, or any other comments you might have concerning the newsletter should be forwarded by June 15, 1999 to Larry Mayou at SRC DC By cc:Mail, larry.mayou@srcorp.com, or (202)488-9740, ext. 173.

Check out the FAA Home Page on Internet (www.faa.gov/and/and700/and740). Please note that as this newsletter goes to press there are still problems with the newsletter portion of the AND-740 Home Page. These problems are being worked on and the newsletter should be available at this site in the future.

NAVIGATION AND LANDING PROGRAMS

Gary Skillicorn, Product Lead, AND-740, (202) 493-45597

MESSAGE FROM THE PRODUCT LEAD:

For those of you that may have missed the news, in March I was asked to set up and lead a new systems engineering organization in AND-700, at least for the next year. Steven Wolf, will be the acting AND-740 Product Lead. My duties will be focused on some of the broader systems engineering issues that we have been working within the Navigation & Landing and Satellite Navigation product teams. Perhaps this position will afford me the opportunity to help guide the future of navigation capability in the NAS beyond that which I can currently reach.

The Navigation and Landing Product Team, with the help of countless supporters, has a legacy of success by providing the backbone of the existing navigation & landing capability. Just look at the runways of any airport! Walk down any airport concourse; know that you helped make safe air travel available to all those folks. You should all beam with pride. I sincerely thank you for your dedicated efforts that made it happen. I expect to see nothing short of continued success from you all.

SPECIAL NOTE

The Navigation and Landing Branch of the National Airway Systems Engineering Divison in Oklahoma City, Oklahoma, has established a contract with Ohio Uiversity. Under this contract Ohio University will provide airborne evaluation and analysis of the signal-in-space at facilities which have been removed from service or which have been severely restricted due to anomalies in the radiated signal. Requests for these services should be made to the Navaids Teams coordinator, Jonnie Harmon, at (405) 9545140, or to the Landing Team coordinator, Dick Caldwell, at **(405) 954-5198.**

PROJECT NEWS

NavAids Type Acceptance Program
PE: Calvin S. Miles, AND-740, (202) 493-4763

Description of Program:

Under the NavAids Type Acceptance Program, AND-740 is responsible for determining the acceptability of NavAids for use in the NAS. This includes NavAids intended for use by both Federal and non-Federal service providers and also includes NavAids developed by manufacturers not under contract with the FAA (commercial NavAids). The FAA may acquire commercial NavAids in accordance with authority provided for under the Acquisition Management System. Non-Federal providers of navigation services may also acquire commercially developed NavAids that meet the performance standards of FAR Part 171, Non-Federal Navigation Facilities. Airport grant aid recipients may acquire NavAid equipment approved under the non-Federal program. ILS and ancillary equipment acquired in this manner may be transferred to the FAA "without consideration" under current law, so AND works with AOS and ARP to establish requirements for equipment to meet the FAA performance standards. Under this Program AND-740 also supports the Non-Federal; Facilities Program and the RTCA Certification Task Force in addition to the Type Acceptance activities.

NavAid Type Acceptance:

Navigation systems for use in the NAS have historically been developed for the FAA under Federal full-scale-development contracts. Companies that developed these systems would also sell the systems to non-Federal sponsors within the U.S. and to service providers outside the U.S. Growth and competition in the non-Federal and overseas markets spurred the development of commercial versions of NavAids. AND-740 is developing a documented process to ensure that commercially developed NavAids meet the performance standards required by the FAA to operate and maintain the equipment. This serves the needs of F&E acquisition and airport aid grant recipients acquiring NavAids that will be turned over to the FAA.

Support to the Non-Federal Facilities Program:

FAA Order 6700.20A, Non-Federal Navigational Aids and Air Traffic Control Facilities, establishes policy and delegates the authority provided to the Administer under the Federal Aviation Act of 1958 [re-codified in Subtitle VII of 49 U.S.C.] AOS-100 manages the Non-Federal Facilities Program and AND-740 is responsible for ensuring that performance of new navigation equipment types and associated modifications are acceptable for use in the NAS. Part 171 of the Federal Aviation Regulations delineate the approval requirements for performance, installation, operation, maintenance, and reporting of non-Federal navigation facilities.

RTCA Certification Task Force:

At the request of the FAA Administrator, RTCA Inc. convened a government/industry task force (TF4) to function as a Federal Advisory Committee to develop recommendations for improving the FAA certification processes, including the development of certification processes for communications, navigation, surveillance, and air traffic management systems. Integrating new systems concepts, embracing new technology and reducing the time and cost associated with equipment type acceptance will substantially contribute to the Agency's performance goals and NAS modernization efforts. AND-740 is integrally involved with the TF4 working groups and is particularly providing information on current type acceptance, type approval, and certification practices for air navigation facilities and equipment. A recommendation report from the Certification Task Force was delivered to the FAA Administrator in February of 1999.

NavAid Type Acceptance Process - Development Status:

AND-740 is planning for a NavAid Type Acceptance Workshop to occur in Oklahoma City towards the fiscal year end. The workshop will provide an open forum for FAA groups to work with manufacturers in identifying required work products and structuring terms of agreements for the Type Acceptance process. A draft Advisory Circular, ISR checklist, and AMSIFAST tool concepts are being developed for presentation at the workshop.

Software Assurance Guidelines – FAA Working Group and RTCA SC-190 Status:

Software assurance is a critical aspect of design assurance of the current generation of software intensive NavAids. The FAA requested RTCA Special Committee (SC-I 90) to develop recommended guidelines for the use of software assurance methods for aviation and CNS/ATM systems. AIT-5, Chief Scientist for Software, is sponsoring a FAA working group to develop software assurance guidelines. This working group is providing FAA input into SC-190. Three NavAids products receiving Type Acceptance through AND-740 have used the software assurance processes being advocated by SC-190 and this FAA working group. AND-730 and AOS-240 have also used these processes and have membership on this group. AND-740 is working closely with the software guidelines working group and SC-190 to develop guidelines to standardize software assurance for CNS/ATM systems.

Status of Type Acceptance and Type Approval Activities:

TLS – Transponder Landing System. The Administrator of the FAA issued Advanced Navigation and Positioning Corporation (ANPC) of Hood River, OR a letter of type certification on May 29, 1998. This facilitated the operational approval for FedEx to use an installation in Subic Bay, The Philippines. The letter stated that prior to placing the first TLS facility in service in the NAS, the commissioning issues of an in-service review (ISR) must be completed. Watertown, WI is the first facility planned for commissioning in the NAS. Many of the ISR issues will be addressed through a TLS operational assessment conducted at Watertown and/or the FAA Technical Center.

ILSs – Instrument Landing System. Certification activities are underway for the ASII 2100 ILS and the Air Sys ATM Mark 20A ILS systems. AND-740 is reviewing specification verification testing results, safety assessment/reliability/ maintainability predictions, and technical manuals for both systems. PCAs have been completed for both systems.

MALSR – Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights. AND-740 is establishing an approved baseline for the Honeywell Hughey & Phillips (HHP) FA-10290 MALSR. The team is developing the testing criteria and procedures necessary to approve the performance of this baseline. Any differences from the AVW FA-10290 MALSR will be incorporated as part of an approved modification. The logistics support baseline is being established to support this baseline.

Very High Frequency Direction Finder (VHF-DF) (CIP No. 24-11)
PE: Greg Rugila, AND-740, (202) 4934768

Status of Project:

An Alert Bulletin was signed by Bill Jeffers, AAT-1 and Joaquin Archilla, AAF-1 and approved by Monte Belger, ATS-1 on March 11, 1996 which recommended that the VDF system not be deployed, and the Direction Finding Services be terminated on October 1, 1997. The termination was postponed to allow a study of the operational need for the VDF.

On Feb 27, 1998 ATO-300 issued a Memorandum Subject: ACTION: “Study of the Operational Need for Direction Finder Services” with a due date of May 22, 1998. As of the date of this publication the final report of the study has not been delivered.

Non Directional Beacon (NDB) and NDB COTS Purchase (CIP No. 44-32)
PE: Billy Nesmith, AND-740, (202) 493-4764

Description of the Project:

This project will fulfill the FY-91, FY-93, and FY-94 appropriated requirements through purchase of

NAUTEL Maine NDI/COTS NDB equipment off the GSA schedule. Equipment purchased were 20 (each) NDB transmitters, battery chargers, monitor alarm receivers with loop antenna, antennas with ATU, and obstruction lighting kits.

Status of Project

Purchase and delivery complete. Items were delivered to the Logistics Center and may be called out by the Regions. Future purchases will be COTS using the GSA schedule.

Sustain VOR/VORTAC - Doppler Conversion Kits (CIP No. 24-03 and 44-14)
PE: Billy Nesmith, AND-740, (202) 493-4764

Description of Project:

Continuing urban development, airport expansions and tree growth in areas surrounding some VOR operational sites have severely degraded signal propagation of essential radials. This has caused restrictions on operational airways, loss of coverage on final approaches, and impaired the efficient flow of air traffic. Relocation of the involved facilities would be very costly and, more than likely, other suitable sites would not be available. Frequently, the most cost effective solution is conversion of these facilities to Doppler VOR. Regional surveys taken in the fall of 1990 indicated that 90 second generation conventional VOR's should be converted to Doppler VOR's.

Summary Schedule:

Production Approval	5/19/94
Deployment Approval	6/13/94
1st System Delivered to Depot	7/27/94
Last System Delivered	7/31/96

Project Status:

74 DVOR kits have been delivered to date. This project is complete.

Regional Interest:

Training for this procurement will be the same as that established at the FAA Academy, which is course number 40261.

VHF Omnirange Test (VOT) CIP (No. 24-03) (Part of VORTAC)
PE: Billy Nesmith, AND-740, (202) 493-4764

Description of Project:

The VOT broadcasts a certified test signal to allow pilots to verify their VOR airborne receivers. The VOT project replaces 65 obsolete tube type VOT systems and establishes 35 new sites. A total of 112 systems have been procured from Canadian Marconi Company (CMC).

Status of Project:

The final system was installed June 12 this project is complete.

Regional Interest:

An update to the VOT Siting Criteria, Order 6810.2A is in final processing for distribution.

VOT Correspondence course #43716 with OJT is required for certification on the FA-10235 VOT. The performance examination should be used for interim certification until the FAA Academy develops the certification examination.

FY-87-90 LORAN-C Transmitters
CIP No. 24-17)
PE: William McPartland, AND-740, (202) 493-
4762

Project Status:

Legislation has been passed by Congress requiring that the FAA implement the Automatic Blink Systems (ABS) upgrade in the LORAN-C System, as well as other undefined upgrades.

An automatic signal "BLINK" (ABS) subsystem was designed for installation in all Loran C transmitters that provide service to the NAS. Automatic BLINK was to operate in addition to the manually initiated BLINK now used. NAVCOM had nearly completed work on building and testing the ABS equipment under contract with the Volpe Center when they were asked to stop work. In the mean time, The Coast Guard conducted a demonstration of automatic blink and requested that production proceed. An 18 month window was then opened to produce the units and perform

the site installations at 31 locations. Final delivery to the USCG took place in March 1999 and installation is ongoing.

Regional Interest:

The FAA will maintain six of the Coast Guard monitors (different from the FAA data monitors) to control transmitter timing. Each involved FAA Region has a separate signal agreement in place with the USCG to cover maintenance of Coast Guard facilities. The requirement is being re-evaluated.

FY87-90 LORAN-C Monitors (CIP No. 24-17)
PE: William McPartland, AND-740, (202) 493-4762

Description of Project:

The Loran-C monitors provide correction data for use with Loran-C non-precision approach procedures. All monitors were installed in VOR facilities and will be connected to the VOR equipment for communication with maintenance, flight standards, and air traffic personnel. A contract with Wilcox Electric, Inc., provided 295 VOR interface circuit cards, including spare units.

Project Status:

Monitor cards have been provided, however, operation of the system is dependent on implementation of the automatic blink system.

LORAN-C
PE: William McParland, AND-740, (202) 493-4762

Congress has directed the FAA use $7M in FY99 to support investigation of the use of Loran as a backup system to GPS for aviation purposes in the event of loss of GPS signal due to a variety of factors. Since the Loran stations are aging, and in some cases in a state of serious disrepair, the FAA has provided approximately $5M to the USCG to address these concerns. The FAA has retained $2M to conduct studies regarding Loran signal availability, reliability and repeatability in a variety of environments. Some specific areas under investigation are a) the use of H-field antennas to overcome signal deterioration due to static caused by precipitation: b) the development of improved receivers and software to select the best signal from all transmitters in view; c) the use of available bandwith to provide a comunnications channel for GPS timing signals (Eurofix); d) the implementation of monitoring to improve signal availability; e) the development of switches signal loss detectors to reduce switch time; f) the use of UPS to maintain operation. Other areas will be investigated as the studies raise issues with sufficient merit.

Low-Power TACAN Antenna (CIP No. 05)
PE: Greg Rugila, AND-740, (202) 493-4768
QRO: Fred Kirk, ASU-240, (703) 450-5680

Description of Proiect:

The FAA maintains approximately 640 TACAN facilities operating in the NAS in support of civil and military aviation. The Low Power TACAN Antenna (LPTA) System program is a replacement for 198 existing RTA-2 type TACAN Antennas.

Summary Schedule:

All deliveries from COMSAT/Radiation Systems Inc. (CRSI) have been completed.

Status of Proiect:

The contract with (CRSI), Sterling, Virginia, is complete. Depot level support has transitioned to the FAALC (POC: Paul Smith (405) 954-2593).

Regional Interest:

Installations of LPTA's under the present National TSSC II work order is complete. The remaining installations will be placed under a new work order when sites are ready and funding becomes available.

Antennas are experiencing premature failure due to failure of the nylos ring collar of the upper motor bearing. An ECP has been submitted by CRSI and has been evaluated. The Logistic Center is conducting an evaluation of alternate causes/solutions. Upon completion of the evaluation, the LPTA Team will determine the best solution to pursue. Implementation of a solution will require identification of funds for modification kits and to establish a retrofit project. Inquiries concerning motor failures and the retrofit project should be addressed to Greg at the above number or Mike Lauermann (202) 488-9740 ext. 135.

Remote Maintenance VORTAC Concentrator (RMVC)
PE: Charles Beam, AND-740, (202) 493-4753

Description of the Proiect:

The current Second Generation VORTAC (FA-9996) Remote Monitoring Subsystem (RMS) network consists of: (a) Level 1, the Facility Central Processing Unit (FCPU) which is collocated with the VORTAC, (b) level 2, The Remote Monitor and Control Flight Service Station (FSS) (RMC-F) which is located at the FSS, (c) level 3, Remote Monitor and Control Center (RMCC) which is located at the Air Route Traffic Control Center (ARTCC).

The RMVC will replace Level 3 and provide a functional replacement for the RMC-C. It will be located at AFSS or ARTCC facilities, and is designed as a NAS-MD-790 compliant interface between the FA-9996 VORTAC system and the Maintenance Processor Subsystem (MPS).

Summary Schedule

Implementation:	
Deployment Decision/ISR	09-96
Baseline NCP Approved	03-97
CCD Completed	03-97
First ORD Completed	08-97
Last ORD Completed	09-99

Status of Proiect:

The RMVC is still on the "Test Pathway" at the designated key test site, in Leesburg VA AFSS reporting to the Leesburg MCC. The "Test Pathway" enabled the MCC operators to familiarize themselves with the new screen displays, which are different from the old RMC-C which the RMVC will replace. Per an approved DRR Variance by AAF-1, installations began in March 1997 by the Technical Services Support Contractor (TSSC) in designated AFSS and ARTCC facilities, with the exception of the Alaskan Region (AAL). AAL will effect their own installations in the Fairbanks, Juneau and Kenai AFSSs. As of December 1, 1998, 59 systems have been installed and site tested. The four remaining systems will be installed in the Central Region starting in April 1999.

Present Activities:

RMVC baseline NCP was approved March 3, 1997. CCD approval was completed March 10, 1997. Copies of the CCD were forwarded to AOS-240 to commence EEM actions to replace the RMC-C with the RMVC. EEM verification activity, such as EPROM installation, new PMDT software, and issuing an updated Section 9 of TI 6820.2 at Kankakee, IL; Bangor, ME; and Anniston, AL; and Princeton, MN, has been completed. Final versions of EPROMS, PMDT S/W and the updated TI Manual are available and can be ordered by the Regions. Point of contact is Sylvester Ivory (405) 954-9773.

Regional Interest:

AND-740 has advised the FAA Regional Offices (including 420 personnel) via cc:mail that the RMVC correspondence training course (No. 44220) is available and can be ordered through the FAA Academy. Regions must coordinate directly with the Depot for shipments of RMVC systems and spare parts kits to their designated facilities. Installation and Verification testing will be effected by Technical Support Services Contractor (Raytheon Services Co.). Regions are advised that NCP action regarding the RMVC is to be completed on a regional level, and not on a national level as was discussed and agreed upon at the Nov. 1994 NAILSMT.

FY89-90-92 VOR/DME Program (CIP No. 24-03)
PE: Charles Beam, AND-740, (202) 493-4753

Description of Proiect:

The VOR/DME system is used to provide azimuth and distance information to properly equipped aircraft engaged in landings and en-route navigation flights within the NAS. Procurement of 70 new "Third Generation" (3G) VOR/DME systems has been accomplished under a contract with Wilcox Electric, Inc., of Kansas City, MO. While functionally similar to the current FA-9996 "Second Generation" (2G) equipment, the new FA-10391 3G VOR/DME includes the latest digital signal processing (DSP) technology, integrated circuits, state-of-the-art technology and MPS interface. Twenty five (25) Doppler VOR (DVOR) conversion kits providing the interface for converting the 3G conventional VOR (CVOR) to a 3G DVOR were included in the contract. The

contract also provided for six (6) DVOR conversion kits to convert a 2G CVOR to a 2G DVOR.

Schedule Summary:

Project Status:

The contractor has completed production and all systems have been delivered. Reprogramming of $12.5M from the VORTAC Program to the Advanced Automation System (AAS) at the direction of the FY93 House and Senate conferees created a shortfall in installation funding. Subsequent reprogramming actions provided "seed money" to start the initial planning efforts to the maximum extent possible. Based primarily on the ability of the Regions to utilize expiring funds, a determination was made by the VOR/DME Matrix Team as to the number and location of the 3G VOR/DME systems that would be installed with the remaining VOR/DME funding. The remaining "installation unfunded" 3G VOR/DME systems were to be placed in depot storage pending further disposition. Subsequent analysis and review by the VOR/DME team determined that these "installation unfunded" systems would be made available to the Regions to meet their requirements. As a result, 3G VOR/DME systems have been delivered for the following sites:

REGION	SITE
ACE	Broken Bow, NE
	Thedford, NE
AEA	De Lancey, NY
	White Sulphur Springs, WV
AGL	Bloomington, IL
	Galesburg, IL
	Milwaukee, WI
ANE	Bridgeport, CT
	Groton, CT
ANM	Big Piney, WA
	Moses Lake, WA
	Pasco, WA
	Vernal, UT
	Walla Walla, WA
	Wenatchee, WA
AS0	Tuskegee, AL
ASW	Maverick, TX

To date, fifty (50) systems have been installed and commissioned or returned to service.

Regional Interest:

No funding from the Washington Program Office will be made available for the "installation unfunded" 3G VOR/DME systems.

All contractor provided training classes have been completed. Training is now being provided by the FAA Academy. Any training required to support the "installation unfunded" systems should be identified through normal procedures.

The equipment contract did not include antennas for the VOR, DME, or Doppler VOR. These antennas, as well as ancillary items required for system installation (such as antenna pedestals, polarizers, antenna mast base plate, 16 foot antenna shelters, mounting fixtures, etc.) for the "original" systems have been made available by the Washington Program Office and have been distributed.

Site level test equipment (SLTE) has been made available by the Washington Program Office and has been distributed for the "original" systems being installed. The 3G VOR/DME SLTE is essentially the same as the 2G VOR/DME SLTE, the major exception being the addition of a peak power meter capable of reading in the milliwatt range which is a requirement of the new 3G DME.

The new system utilizes a 450 ampere hour, 48 volt dc standby battery system in lieu of the 36 volt dc system provided for the 2G VOR/DME equipment. The batteries and racks required for the 3G VOR/DME systems are to be procured by the Regions.

On-site spare parts kits have been procured using a ratio of 2 ea. on site spare parts kits for every 3 ea. VOR/DME systems procured. All available on-site spare parts kits have already been distributed.

The initial 3G VOR/DME systems installed utilized an interim RMM interface that did not interface with the MPS. Site Program Bulletin (SPB) 128 released on 6 May 1996 made provisions for installation of the required software throughout the NAS and accommodates each 3G VOR/DME site's RMM interface with its respective Center's MPS

FY87-89 Runway End Identifier Lighting System (REILS) (CIP 24-09)
PE: Seth Couslar, AND-740, (202) 493-4756

Description of the Proiect:

The REIL provides pilots with rapid and positive identification of the approach end of a runway.

Project Status:

A contract for FY87/93 REILs was executed with the DME Corporation of Ft. Lauderdale, FL, for 251 systems.

Regional Interest:

251 REIL systems have been shipped to the FAA Logistics Center. All sites scheduled to receive FY87/93 REILs have been provided installation funds.

Remote Radio Control System (RRCS) (CIP 24-09)
PE: Seth Couslar, AND-740 (202) 493-4756

Description of Project:

The RRCS is used to control the operation of Visual Aids Lighting Systems. The systems are controlled from the tower with an FM-transmitter on a unique frequency with an identification code. An FM-receiver and decoder at the lighting system's control station receives the signal, turns the system on and off, and controls intensity.

There are two RRCS systems, one built by Sonicraft Inc., which was deployed several years agoand the other now in production by New Bedford Panoramex (NBP).

Project Status:

NBP has completed the FY-92 base contract and delivered 300 RRCSs.

Regional Interest:

All NBP RRCSs and subassemblies are shipped to the FAA Logistics Center for distribution to the Regions as required. The Sonicrafts RRCSs are being modified by AOS-240 in Oklahoma.

Remote Radio Control Interfce Unit (RRCIU) (CIP) 24-09)
PE: Sandra Stewart, AND-740 (202) 493-4770

Description of Proiect:

The RRCIU is designed to allow the Remote Radio Control System (RRCS) to interface with the MALSR, PAPI, REILS, ODALS or VASI systems. The primary function of the interface unit is to convert DC and AC signals into AC lines of voltages.

The RRCIU was built in conformance to FAA Specification FAA-E-2663, dated November 18, 1976. Currently there are two types of RRCIUs used in the field, one built by Acudata Systems, Inc in 1982, and one built by AVW Electronics in 1986.

The objective of this project is to purchase new RRCIUs to meet future system deployment requirements.

Proiect Status:

The procurement for this project has changed to a "Build to Print" approach with support from AOS-240. An updated specification, an engineering package, a test set with test procedures and a prototype will be developed by AOS-240 and provided to AND-740 for inclusion in a procurement package. The Acquisition Schedule is as follows: Release Screening Information Request (SIR) August 1999, Contract Award September 1999, and First Delivery to FAALC Depot December 1999.

FY86/92 Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) (CIP 34-09 and 44-33)
PE: Seth Couslar, AND-740, (202) 493-4756

Description of Project:

The primary purpose of the MALSR with Remote Monitoring Subsystem (RMS) is to provide pilots with visual approach guidance on Category I runways. It includes remote maintenance monitoring capability.

Project Status:

A contract for 59 systems (3 first article and 56 production units) was awarded April 5, 1994, to the DME Corporation. The program office has exercised an option that added 21 systems to the contract bringing the total contract quantity up to 80 systems. The OT&E was completed and a quick look report has been issued by ACT-360. Production approval was given to DME Corporation on September 1, 1998. As of February 28, 1999, 42 systems have been shipped.

Regional Interest:

The DME design has incorporated solutions to several known concerns associated with the AVW systems, such as modifications to the individual control cabinets, and main control cabinet and the relay contractors. The DME MALSR also provides additional high voltage protection and includes a new aiming device.

An Effort has been started by AND-740 to certify MALSR manufacturers. This certification will allow the FAA and Airports to buy MALSRS directly from the manufacturers.

Precision Approach Path Indicator (PAPI) (CIP 24-09)
PE: Sandra Stewart, AND-740 (202) 493-4770

Description of Project:

The PAPI is a visual glide slope indicator which provides pilots with approach slope information while in final approach.

Project Status:

Currently there is one PAPI procurement in place with New Bedford Panoramex (NBP) Corporation in Upland, CA. NBP will be providing ten congressionally mandated PAPI systems with Remote Monitoring Subsystem (RMS) for use in the Alaskan Region, and prior year congressional equipment shortages.

Regional Interest:

Repair services for PAPIs has been implemented at the Depot.

Technical Instruction Books are available at the Depot.

CBI Training course available on the system.

High Intensity Approach Lighting System with Sequenced Flashing Lights (ALSF-2) (CIP 24-10 and 34-06)
PE: Billy Nesmith, AND-740, (202) 493-4764
QRO: Mike Smith, ASU-240, (909) 982-9806 x256

Description of Project:

The ALSF-2 is installed on runway approaches to provide visual guidance for Category II and III aircraft operations and is also installed as part of the Approach Lighting System Improvement Program. The ALSF-2 features a new lamp-out monitoring system, a new PAR-56 lampholder design, dry-type constant-current regulators, and a Remote Monitoring Subsystem.

Summary Schedule:

NBP Contract:	
Contract Award	Sep 24, 1993
Critical Design Rev iew	Sep/Oct 1994
1 st Article	Sep 1996
1 st Production Unit	May 1998
Last Production Unit (Option 1)	Feb 2001

Project Status:

New Bedford Panoramex (NBP) was awarded a contract to produce 19 ALSF-2 systems. These systems will have a new operational monitor and remote maintenance monitoring capability. The contract includes two options for 15 ALSF-2s each. The first option was exercised in September 1994. Critical Design Reviews for hardware and software were conducted in September and October 1994 respectively. Formal testing of the ALSF-2 system started on September 6, 1995 with the successful testing of the constant current regulators. Environmental testing was completed in July 1996. Phase I Formal Qualification Testing (FQT) of the operational hardware and software was completed in October 1996 and the OT&E system was delivered and installed in November

1996. Phase I OT&E was completed in February 1997 with outstanding issues concerning the lamp monitor (the RMS software was not mature enough for testing). Phase II Formal Qualification Testing was completed in May 1998. Hardware FCA/PCA was held in May/June 1998. Discrepanices noted have been closed. Phase II OT&E/Shakedown testing was completed in August 1998. Regression testing Phase I began on November 17, 1998 and was completed on December 16, 1999, with a determination that the lamp monitoring transceiver needed to be environmentally hardened. Re-designed transceivers were installed at the Memphis Airport in December 1998. A software audit was conducted in December 1998. Informal testing was conducted at Memphis in preparation for Phase II regression testing. Phase II regression testing is scheduled to resume in early April 1999.

Regional Interest:

Memphis, TN was selected as the key site and has been operated without the lamp monitor since February 1997.

Approach Lighting System (ALS) Research and Development (R&D) PE: Charles Beam, AND-740, (202) 493-4753

The Navigation/Landing Product Team (PT) is in the process of developing an Approach Lighting System (ALS) Research and Development (R&D) effort. The objective of this proposed effort is to try and develop new low cost Las's incorporating new lighting technology. The intent is to look at all available technology applicable to lighting, develop one or more prototypes, conduct testing, and develop new approach lighting system procurement requirements. Although the initial focus has been on the Medium Intensity Approach Lighting System (MALSR), it is anticipated that this R&D effort will also include other visual guidance lighting systems.

A significant portion of the visual guidance lighting infrastructure has exceeded its normal life expectancy with some estimates indicating the average age of the infrastructure at 25-30 years old. The NAS draft Architecture, version 4.0 dated October 13,1998, identifies a $2.858 requirement for visual guidance lighting infrastructure replacement over the next 20 years. As a 15-year life expectancy was used, this estimate includes a portion of the second wave replacement of the first 15-year cycle Las's. A more realistic estimate for the infrastructure replacement is probably on the order of $1.5B. It is anticipated that an R&D expenditure of 2% of the infrastructure replacement value could generate a 20% savings in overall life cycle cost of the visual guidance lighting infrastructure. Using the $2.85B infrastructure identified in the NAS draft Architecture, version 3.0, a 20% savings of $570M could result from the expenditure of a comparatively small amount of R&D funds.

Efforts to date have been limited to:

* Several small business innovation research (SBIR) efforts
* An academic effort consisting of a data search, a symposium, and some very basic requirements analysis
* Several studies using the FAA B727 flight simulator with commercial/FAA pilots investigating various lighting configurations based on the MALSR configuration:
* Modification of the MALSR test bed at the FAATC to accommodate ALS testing.

The Navigation/Landing PT efforts to justify ALS R&D funding requirements in FY99 and FYOO RE&D budgeting cycles were favorably received; however, the prospects for funding are not good when prioritized against more urgent FAA funding requirements. Efforts are underway to justify ALS R,E&D funding in FY 01. Although funding is very limited, the PT welcomes the opportunity of working with academia, industry, state and federal organizations that may be interested in developing this ALS R&D effort.

ILS Remote Maintenance Monitoring (ARMS) PE: Mike Rivers, AND-740, (202) 493-4766

Description of Project:

The ILS-RMM (ARMS) program provided add-on capability for remote maintenance monitoring to Wilcox Mark ID through IF Instrument Landing System equipment and co-located type FA-9783 DME's. This original program purchased equipment for approximately 250 ILSs.

We are currently investigating procurement of a newer technology version of an ILS-RMM system developed by AOS-240 as part of the ILS Service Life Extension Program (SLEP 4). This system is

based on Wilcox Mark 20 hardware and will be compatible with new and old RMSs. Like ARMS, this is essentially a read-only system, offering no more control than the ability to turn the ILS on or off. It will provide indications as to what may have failed, and will provide a remote monitor that may tell you that the ILS is off the air sooner than a PIREP would.

Summary Schedule:

Two kits (localizer and glide slope), are required per runway. Tests in Bangor, Me. proved that they worked.

The top 60 runways have been selected based on data from the SLEP 4 cost-benefit analysis. A total of 120 kits will be required for the runways.

Because of money constraints, production for 60 runways is being procured in lots of 20 kits. Delivery of the first 20 units took place as follows:

1st article:	10/97
Test of 1st article	45 days
Estimated 1st delivery	3/98
Last delivery	6/98

Cost is estimated at $771 K

Project Status:

A cost benefit analysis was performed during the period 1995 to 1997. Based on the results it was determined that up to 180 runways could benefit, although many were marginal.

Based on the results, and budget restraints, 60 runways were selected initially. The details of the first contract are detailed above. Prior to that, AOS-240 was provided $720K to develop and procure a prototype RMM kit in 1995. The units were tested in Bangor, ME. as mentioned.

A second contract for 20 additional kits (for IO runways) have an estimated cost of about $720K.

A third contract for 20 additional kits (for IO runways) is expected to cost about $500K. Options will be included to provide 60 additional units, to complete the 120 kits required to take care of upgrading 60 runways.

Regional Interest:

While the study has identified the sites based on a set of parameters and data best available at the time, it behooves the Regions to review their records and determine which sites are most suitable under the latest conditions.

- All ILSs will be Mark ID or newer, thanks to the SLEP.
- The ILS Maintenance Handbook will be revised so that monthly site visits will not be required; site visits will be quarterly, as is currently authorized for ILSs with RMM.
- Staffing might be at a lower level.

The most important considerations are probably accessibility and travel time to a site requiring maintenance. You might think of others.

ILS Service Life Extension Project (SLEP) (CIP 44-22)
PE: (SLEP 1/2/4) Mike Rivers AND-740, (202) 493-4766
QRO (SLEP3A): Ed Gore, ASU-240, (708) 369-6167
PE: (SLEP 3) Mike Flynn, AND-740, (202) 493-4758

Description of Project:

The purpose of the Mark 1B/C Service Life Extension Project (SLEP) is to replace major subassemblies of the Mark 1B/C ILS with current design/production Mark 1F-like equipment. Transmitters, power supplies, monitors, control units, and integral detectors have been manufactured and are being provided for direct replacement. In addition, we are purchasing kits to support optional conversion of existing 15-element V-Ring antennas to 14-element configuration arrays for sites with commissioned back courses, or providing new 8 or 14-element LPD antennas to replace V-rings if back courses are not required. Note that this antenna replacement/conversion

program is only for sites with Mark 1A/B/C systems upgraded to the Mk-IF configuration.

We have been supporting this program by purchasing build-to-print equivalents of Wilcox Mark IF equipment. Contracts have been awarded to New Bedford Panoramex and Roselm for the electronics, and both companies have completed production under their current contracts. Contracts providing 14-element conversion kits for 15-element V-ring localizer antennas made from FAA standard parts, or providing LPD's for replacement, have been awarded to NavCom and Wilcox, respectively. AOS-240 provided miscellaneous installation hardware and cabling to support installation of equipment purchased under SLEP 1 and 2 contracts, and also provided turnkey installations for regions who requested it.

Projected Schedule

Contract Awards SLEP 1 & 2	Completed
Contract Award SLEP 3A	3/96
First Article	9/96
First Production Delivery	6/97
Contract Award SLEP 3B	3/96
First Production Delivery	6/97
SLEP 3B Final Delivery	7/98

Project Status:

All equipment provided under the SLEP 1 and SLEP 2 contracts has been delivered and installations are complete. Don Megehee of AOS-240 and his support crew from MACA deserve a big pat on the back for their good job of distributing equipment in a timely manner so that it was on site when installation crews were ready for it.

I'm truly amazed that, despite several changes to regional wish lists for SLEP equipment, discoveries of uncounted old equipment, and Mark 20 "leapfrogs" that didn't quite work out, we ended up buying the right amount of equipment - no shortages and no significant excesses. A small follow-on order for glideslope monitors was placed in April to take care of lost shipments and dead-on-arrivals for the remaining sites since we came out exactly even on that item according to the latest plans. SLEP 1 and 2 have been completed. Thanks for all your hard work on this complex program.

SLEP 3 was implemented with equipment purchased under two contracts, one for localizer log periodic dipole antennas specified by FAA type number (SLEP 3B), and a second contract for V-ring conversion kits (SLEP 3A).

The contracts were awarded in March 1996 to Wilcox Electric for the LPD antennas and NavCom for the V-ring conversion kits. The Wilcox contract is essentially off-the-shelf production with the addition of a test of the fully assembled distribution unit prior to shipment. Wilcox has shipped all the LPD antennas. A few systems were direct shipped to sites while the majority were placed at the Logistics Center and are available for Regional call out. The NavCom contract required some engineering to choose a new, smaller box for the distribution unit, and design an appropriate wiring harness and AC power distribution system. NavCom is purchasing distribution unit components from New Bedford Panoramex. The first article unit was set up and tested successfully in September 1996. First delivery of 4 units took place in June 1997. In July, August, September and October the next 16 units were shipped. The first 8 kits went to the Depot and the rest went directly to sites. 15 kits were produced and shipped between November and January. The final 5 kits under the base contract were shipped March 5th.

PRs to obtain monies for ordering parts and antennas under the options for SLEP 3B, and additional kits under SLEP 3A, were signed in May. The SLEP 3B contract options have been exercised and awarded to Wilcox. Production and delivery of 15 additional 8-element LPD and ten 14-element arrays have been completed. An additional 5 8-element LPD's were also ordered and completed.

The SLEP 3A contract options for 20 additional V-ring conversion kits have been awarded. The first 5 units were delivered in April. The next 4 units were shipped in June. Additional deliveries were planned in late June and July. Instead, one unit was shipped in November and the balance of the 9 shipments were made in March 1999. AirSys ATM is providing the electronics which were formerly provided by NBP.

PIR (Portable ILS Receiver) Replacements
PE: Mike Flynn, AND-740 (202) 493-4758
QRO: Michael Smith, ASU-240, (512) 793-2276

Production is complete and all the PIRs have been delivered to the FAA Logistic Center.

SDM (Snow Depth Monitor) Redistribution
PE: Mike Flynn, AND-740, (202) 4934758

The FAA Logistic Center has some SDM's available for use. Contact Mike Flynn if you have any requirements.

COTS/NDI LOW POWER DME
PE: Greg Rugila AND-740, (202) 493-4768

Description of Proiect:

This project will provide for up to 59 Low Power DMEs to support ILS requirements, Congressional Add-ons and emerging requirements. The basic contract provides for 38 DME systems and there are 2 additional option years with up to IO systems per option. The DME equipment procured is RMM capable. AND-130 has developed the RMM interface under a parallel development.

Proiect Status:

The contract for the Low Power DMEs was awarded to Airport Systems International Inc. (ASII), Kansas City, KS. The contract provides for site spares, contractor training and Contractor Depot Level Support (CDLS) in addition to the DME systems.

The second option has been exercised for 1 system to meet a Congressionally mandated requirement and, has been modified to increase the total number available to 20 systems. Fourteen additional systems have been acquired under this option to meet the FY-99 Sustain DME requirements. Deliveries of these systems have begun and will continue through the fourth quarter FY-99.

Activities:

Contract Award	January 6, 1997
First Delivery (Basic)	May 13, 1997
First Training Class	June 3, 1997
Last Delivery (Basic)	February 1998
First Delivery (1st Option)	February 1998
Last Delivery (1st Option)	April 1998
First Delivery (2nd Option)	July 1998
Last Delivery (2nd Option)	August 1999

RMM Interface Development:

AND-130 has developed the RMM interface to the ASII Model 1 118 DME using the new RMM architecture which incorporates COTS proxy agents and open system protocols. OT&E was conducted at Los Angeles utilizing the four systems installed there. Regression testing of the OT&E discrepancies has been completed and delivery of the Proxy Agent is expected no later than the fourth quarter FY-99.

Wilcox Mark 20 ILS - Category II/III ILS AN/GRN-27 (CIP 44-20), Wilcox Cat II/III Replacement Program (CIP 44-21), MK1A Replacement (CIP 44-22) and New Establishments (CIP-34-06)
PE: William McPartland, AND-740, (202) 493-4762
QRO: Mark Saulet, ASU-240, (816) 452-0418

Description of Project:

The Mark 20 Instrument Landing System modular design is based on a new generation of microprocessors and software. With Remote Maintenance Monitoring (RMM) capability and the concept of "remove and replace" maintenance, it is providing runways throughout the U.S. with a more reliable and easily maintained system. The Mark 20 is replacing the AN/GRN-27, older Wilcox Cat II and Ill ILS systems, MK1A systems, and provides for any new Cat I, II, or Ill establishments or upgrades in the near future. The systems consist of glide slopes, localizers, outer, middle, and inner marker beacons, far-field monitors, portable ILS receivers, and antennas. Since the Mark 20 ILS is replacing existing systems, equipment shelters will not be provided by headquarters.

Schedule:

Contract Award.....Sep 1991
First Article Testing (start).....Nov 1993
Production Go Ahead.....Nov 1994
First ORD.....Jan 1995

Project Status:

The Cat I/II/III ILS (Mark 20) was granted approval for deployment by Mr. Stan Rivers, AAF-2, based on a successful DRR Prebrief conducted on 13 October, 1994. Production approval was granted by AOA-1 on 16 November, 1994. The First Article Test (FAT) system at Kansas City Airport successfully passed flight inspection in early December and was commissioned in January 1995. Delivery of the first production systems began in February 1995 and has continued on schedule since that time at the rate of 5 (sometimes 6) per month.

Regional Interest:

Shipment of MK 20 systems was completed 2/8/98 for a total of 186 systems. Options for an additional 40 systems remain available until 12/31/98.

AS OF 12/1/98

REGION	SHIPPED	INSTALLED	COMMISSIONED
ALASKA	5	4	4
CENTRAL	10	8	7
EASTERN	35	35	33
GREAT LAKES	25	20	19
NEW ENGLAND	9	6	5
NORTHWEST MOUNTAIN	14	17	16
SOUTHERN	41	37	37
SOUTHWEST	27	20	16
WESTERN PACIFIC	13	13	12
TOTAL	181	160	149

A Wide aperture localizer antenna kit is now under contract. Delivery of all systems has been completed. The contract mod for developing kits to interface with Null Reference, Sideband Reference, and End-Fire Glide Slope antennas as well as Redlich and Wilcox 14/6 localizer cable kits was signed 4/8/97. Delivery of these antennas began in the fall of 1998. There has been a new system software release (number 2) approved which is available through an EEM issued by AOS-240. The new software was introduced into production system Serial number 140. Release #1 is presently available from AOS-240 as an EEM. Release #1 (EEM 551) provides a calibration procedure for using the HP 437 power meters and correcting anomalies with the Far Field Monitor initialization. Other changes that will minimize aural alarms in the tower cab are in this release.

Tech. manual updates for Release #1 or 2 and the EPLD changes were received from Wilcox and are available for distribution. Contact AOS-240 for the latest distribution schedule.

Many regional personnel have expressed their belief in the usefulness of Wattmeters. Thus, for the time being, Wattmeters and Wattmeter elements will remain ONHAND on the Mark 20 PSRs. To guarantee access to the Wattmeter equipment at sites at which it will be used, Regions should requisition it as soon as possible.

Runway Visual Range (RVR), CIP N-08
(CIP 24-08, 34-08 and 44-29)
PE: Deborah Lucas, AND-740, (202) 493-4761
QRO: Wilbert Bentley, ASU-240, (310) 442-4253

Description of Proiect:

The purpose of the RVR program is to procure and implement a new generation RVR capable of supporting ILS/MLS/GPS Category I, II, and III a/b operations. This equipment will decrease maintenance workload, reduce the installation problems associated with the current design, and provide for easier and less costly future expansion. This equipment will replace existing NAS RVR and Runway Visibility Value (RVV) systems and satisfy new RVR establishment requirements. Teledyne Controls Corporation is the RVR contractor.

Schedule:

Contract Award.....June 29, 1988
DRR EXCOM.....August 17, 1994
RVR Deployment.....August 17, 1994

Project Status:

New generation RVRs represent the state-of-the-art measurement of runway visual range. The new system calculates RVR inputs from three sensors; a downward sloped forward scatter meter using Infrared technology, an ambient light sensor with a full range photometer, and a runway light intensity monitor with induction pickups for the runway edge and centerline circuits. It is the first RVR with a dynamic range, in one instrument, capable of providing RVR values from 50 ft to 6500 ft in all weather conditions. It is capable of operating in blowing snow or rain to dense fog and is certified for full Category Ill a/b operation. The system is frangible mounted, with a demonstrated system MTBF of over 20,000 hours and includes embedded remote maintenance monitoring.

RVR systems being deployed, installed and commissioned throughout the NAS are identified as the National Deployment Baseline (NDB). Minor software changes have been developed for inclusion into the NDB RVRs which, when incorporated into the RVR systems will identify the systems as NDB-1. All RVR hardware shipped prior to 1/1/96 requires NDB-1 kits to upgrade systems to the NDB-1 configuration. **If these systems have not been converted to NDB-I, please take immediate action to upgrade your systems. If there are any questions regarding which sites need the kits, contact the below named individuals.** NDB-1 kits are available under EEM 6990.2, CHG 59, Chapter 68, titled Firmware Revision for Runway Visual Range (RVR), Type FA-10268 dated 5/21/96. All RVR hardware shipped in CY 1996 has this EEM embedded from the factory. If a copy of the EEM is required, contact John Kirkpatrick or John Saledas (202-488-9740) for a copy of the EEM. The RVR system was commissioned on 2/16/99 at Austin/Bergstrom TX (BSM). A non-fed system had been commissioned earlier and taken over by the FAA bringing the count to 135 commissioned NGRVR sites.

Interim system upgrades are being installed at selected airports which have an interface capability with the National Weather Service Automated Surface Observing System (ASOS). There are 119 RVR/ASOS interfaces required in the NAS. Installation of interim interfaces (palmtop) began in July 1997 on the West Coast. Currently, eighteen operational interim interfaces have been implemented and commissioned. The interim interface can only be installed where there is a commissioned ASOS and RVR (NDB1) system.

Production ASOS/RVR kits are being assembled at the FAA/-MMAC by AOS-240. These kits consist of replacement EPROMS, for the DPU Product Processing Boards (PPU) and the DPU Maintenance Processing Board (MPU). Selected site locations will receive full RVR kits for installation under an EEM. (expected in the May 1999 timeframe). The balance of the RVR installations will receive replacement EPROMS. In this manner all RVR DPUs will have identical software versions. The method of deploying the replacement EPROMS only, will be determined at a later date.

Critical funding cutbacks have delayed the procurement of additional RVRs as part of the Capital Improvement Program, CIP#N-08. A new procurement for replacement of the remaining Tasker 500 RVRs in the NAS has been delayed indefinitely.

RVR shipment quantities and number of airport locations commissioned as of February 28, 1999. are reflected in the following table:

Region	1994-1996 Shipped	1997 Shipped	1998 Shipped	CO MM
AAL	8	3	0	11
ACE	9	3	2	12
AEA	11	4	1	10
AGL	24	2	1	26
ANE	11	2	1	13
ANM	12	3	2	15
AS0	18	1	0	19
ASW	14	2	1	15
AWP	20	2	0	14
Academy	3	0	0	0
AOS240	1	0	0	0
FAALC	0	1	0	0
FAATC	0	1	0	0
OTIS	1	0	0	0
Total	132	24	8	135

The program office has negotiated a new contract modification. Highlights of the modification cover: Upgrade of STTE tooling to the deployment configuration (NDB-I), updating the off-site manual to the NDB-1 configuration including the production ASOS card, buying additional spares and repair parts, extending CRS, replacing obsolete parts with new qualified parts, extending engineering and software support services through CY-99, component-level Depot training, CY-98

deliveries, and refurbishment of returned equipment.

Critical funding cutbacks have delayed the procurement of additional RVRs as part of the Capital Improvement Program, CIP#N-08. A new procurement for replacement of the remaining Tasker 500 RVRs in the NAS has been delayed until the FY-99 timeframe.

Regional Interest:

An RVR "Hot Flash" has been issued to all regions advising of the shortage of RVR Controller Displays. The CD Diachronic Liquid Crystal glass and Liquid Crystal Display (LCD) driver card used in the front panel have become obsolete. New glass has recently been qualified and the LCD driver card is being redesigned. It is expected that CDs with the new glass and LCD driver card will be available in 4-6 months. In the meantime the balance of the CY 98 RVR shipments will be done without the CDs. This will affect the following locations: BUF, CMH, BOI, ABQ, ABI and HSV. The program office will use these CDs to support CRS. The regions are requested to help by looking in-house for assets. Sources such as supervisory AT positions, ground control, training, least used ATC position hardware delivered to non commissioned sites within the region are candidate sources for spare CDs.

The RVR Product Team's third issue of the bi-annual technical newsletter called "The RVR Hot Sheet" will be sent out in Spring 1999. The second issue was published in October 1998. It addressed RVR national and regional issues and provides a forum for all regions to share their experiences in identifying and correcting field problems. The newsletter is technical in nature and provides field level information to be used by the on-site technician and regional engineers in maintaining and servicing the RVR system. The "Hot Sheet" is published on the AND-740 RVR web page (http://www.faa.gov/and/and700/and740.htm) click on the Programs button and then select RVR.

When new generation RVRs are installed, do not remove the transmissometer that provides input to the strip chart recorder at NWS. The FAA has committed to providing RVR long-line information to NWS so that airlines can continue to use this product for filing flight plans under instrument meteorological conditions. The NWS has committed to continuing to report the RVR manually through the surface observations. Both the FAA and NWS are automating their respective systems through the new generation RVR and the automated surface observing system (ASOS) programs respectively. It is imperative that the long-line RVR service is maintained until the ASOS and RVR interface is completed.

The FAALC has been supplied with Tasker 400 and 500 RVR equipment for spare parts. These spare parts will be used to support those units still in operation in the NAS.

All Regions are requested to return failed items to Teledyne as soon as the new item is received. The Regions are requested to provide a brief description of the failed item so that a definitive starting point for troubleshooting can be ascertained. Call AOS-240 [Jerry Ouillette (405) 954-5163] if assistance is required to determine the defective component. We are spending a lot of money determining that at least 28% of returned items are good.

Contact Points:

Deborah Lucas,(AND-740) 202/493-4714
Greg Rugila, (AND-740) 202/493-4768
John L. Saledas (SRC) 202/488-9740 x158
John D. Kirkpatrick (SAIC) 202/488-9740 xl 61

Established Compass Locator Outer Markers (LOM) (CIP No. 34-04)
PE: Billy Nesmith, AND-740, (202) 493-4764

Description of Project:

This project will provide non-developmental items/commercial-off-the-shelf (NDI/COTS) Non-Directional Beacon (NDB) equipment for installation as LOM facilities with exisitng and planned ILS projects. The LOMs are needed to provided ILS approach and transition fixes as well as navigation and missed approach guidance when an ILS aproach must be aborted.

Summary Schedule:

PR for GSA Purchase.....May 95
Contract Awarded.....Nov 96

1st Delivery to Depot.....March 95
Last Delivery To Depot.....July 96

Status of Project:

The purchase will provide systems to meet FY-93 and 94 requirements.

Regional Interest:

A contract for NDI/COTS NDBs has been awarded, and this approach is being pursued for LOMs.

Low Impact Resistance (LIR) Structures; (ALSIP)
PE: Gary Rixmann, AND-740
(202) 493-4767

Description of the Project

DTFA 01-98-D-0306 - Low Impact Structures (LIRS). Approach Lighting Systems Improvement Program: The contract has been approved (May 1998), the FAA Regions, and FAA Depot that LIRS structures and components are available from Jaquith Industries and being shipped to the FAA for deployment as requisitioned by the FAA field locations. AND-740 will monitor its progress.

Procurement contract DTFA01 -98-D-03006 has been awarded to Jaquith Industries, Inc. of Syracuse, New York to provide low impact resistant (LIR) support structures and associated components for approach lighting system (ALSF-2 & MALSR) and runway visual range (RVR) projects.

The national contract lists twenty-one (21) standard LIR components in Section B.3 which will be shipped to the FAA Logistics Center (FAALC) in Oklahoma City for storage and subsequent requisition by the FAA Regions for F&E projects. The FAA points of contact for ordering this material from the FAALC are Vonya Brown, Washington Item Manager (WIM) for the Landing/RVR Projects, AND-740 at phone number (202) 493-4754 and Carol Galusha, WIM for the Visual Lighting Projects, AND-740 at phone number (202) 493-4776.

An additional twenty (20) "Open Items" recommended by regional project engineers are listed in **Section** B.2 of the contract, however, these items must be purchased direct from Jaquith Industries and will not be part of the F&E stock in Oklahoma City. These contract line item numbers (CLINs) 0022 through 0041 will be available during the entire contract period of performance.

Jaquith Industries will accept a Regional Purchase Order for any of the forty-one (41) different items listed in the contract at the current national contract price. The invoice for LIR materials and related shipping costs will be submitted direct to the region for payment.

Jaquith Industries, Inc. (315) 478-5700
600 Brighton Avenue FAX: 478-5707
P.O. Box 780
Syracuse, New York 13205-0780

A complete list of LIR components available and additional details have been sent to Regional Associate Program Managers.

Category I (CAT I) Microwave Landing System (MLS) (CIP 24-07)
PE: Gary Rixmann, AND-740, (202) 493-4767

Description of the Project

This project involves the installation of non-developmental item (NDI) Category I MLS equipment that will be Commissioned for Special and/or Public Use and provide full service precision approach and landing guidance to airport runways.

Under the contract with AlliedSignal, each Model B-21.5-40S (Series 406) MLS is required to meet the NDI performance requirements of the FAR, Part 171, "Non-Federal Navigation Facilities".

Summary Schedule

AlliedSignal MLS Contract No. DTFA01-91-C-00021

Status of the Project:

The project involves the establishment of 26 Category I, NDI MLSs. Half of the sites are installed in the Alaskan Region (13 sites), and the majority of the remaining sites are installed in the

Northwest-Mountain Region. The AlliedSignal MLS production was completed ahead of the original contract schedule date.

Regional Site Preparation Schedules:

A listing of the AlliedSignal MLS locations commissioned, ´ published FAA owned and operated .is indicated below:

Valdez, AK (VDZ 06)
Andrews AFB, MD (ADW 19L)
Wenatchee, WA (EAT 29)
North Bend OR (OTH 22)
Sand Point, AK (SDP 13)
Glasgow, MT (GSG 28)
Moses Lake, WA (MWH 32R)
Portland, OR (PDX 28L)
Bethel, AK (BET 36)
Wilmington, DE (ILG 09)
Bellingham, WA (BLI 34)
Saint Mary's, AK (KSM 16) *
Cold Bay, AK (CDB 32) *
Dillingham, AK (DLG 01)
Dutch Harbor, AK (DUT 12)
Seattle, WA (SEA 16L)
Fayetteville, AR (FYV 34)
Anchorage, AK (ANC 06L)
Boise, ID (BOI 28L)
Pullman, WA (PUW 23)
Unalakleet, AK (UNK 14)
Saint Paul, AK (SNP 18)
Nome, AK (OME 09) *
Savannah, GA (SAV 27) *
Homer (HOM 21) *
Sheyma AFB, AK (SYA 10) - USF
Galbraith Lake, AK (GLM 12) - (Owned by ALYESKA

AlliedSignal MLS installed and awaiting publication and commissioning are:

Steamboat Springs, CO (SBS 32)

Additional Activities

TWO WILCOX systems (Kansas City, MO and Chicago Midway) have been transferred to the Minnesota Air National Guard for installation and flight crew training. A similar system was transferred from New York JFK to Embry Riddle University to be used for technical training. The FAA maintenance handbook recently published is: Maintenance of ASCS Microwave Landing System (MLS) Facilities (6830.3A).

Regional Interest:

The MLS equipment is maintained by FAA technicians; with contractor providing technical support of MLS facilities when requested by the FAA. Contractor support includes depot logistics support service (identified in the MLS contract as contractor repair service), on-call engineering support services and on site line replacement unit (LRU) training for FAA maintenance technicians.

Operational MLS support (including FAA technician training) with AlliedSignal is in place and may be exercised until 9-30-02. FAA, manages, administers, and monitors the contract.

End Fire Glide Slope (EFGS) Antenna Program (N 03)
PE: Deborah Lucas, AND-740 (202) 493-4761
QRO: Frank Bachelor, ASU-240, (301) 640-3879

Description of Project:

The project will provide non-developmental items/commercial-off-the-shelf EFGS Antenna System equipment for installation at airports where civil engineering costs and available land make installation of a conventional glide slope antenna (currently purchased under full and open competition) impractical. Where the terrain is unsuitable for an image-type glide slope antenna, the End-Fire Glide Slope Antenna system replaces the standard antennas, monitor pickups, amplitude/phase control unit, monitor recombining network, and interconnection wallbox installed in a conventional Capture-Effect Glide Slope. This modified system provides the final approach glide path information to a landing aircraft, enabling the pilot to maintain the proper glide path until visual contact is made with the runway and the landing completed. This is a non-image system in that the path angle is determined by the relative phase of the signals radiated by the front main antenna and rear main antenna. The functioning of the antenna system is essentially unaffected by adjacent low ground or a body of water with tidal variations. The system will consist of front and rear main guidance transmitting antennas, front and rear clearance transmitting antennas, clearance monitor antenna, three field monitor antennas, interface unit, test probe, obstruction light kit, and hardware for installation.

Schedule:

First System Delivery	May 15, 1998 (St. Louis)
Second System Delivery	Oct. 14, 1996 (AMES, IA)
Third System Delivery	Jan 13, 1997 (DeKalb-Peachtree)
Fourth System Delivery	May 13 1997 (transfer from Windsor Locks to Buffalo-install this summer - Model 105)
Fifth System Delivery	Sept, 1997 (Providence, RI) (in storage at region/potential installation this summer)
Sixth System Delivery	Jan, 1998 (in storage FAALC - Model 106)
Seventh System Delivery	May 1998 (in storage at FAALC - Model 106)
Eighth System Delivery	Sept., 1998 (in storage FAALC – Model 105)
Resident classes for FY99	Sept. 14-16, 1999 Sept. 21-23. 1999

Project Status:

The hardware deliveries of the contract (8 systems) have been completed and distributed. Three systems are in storage in the FAALC: two Model 106 ("short" systems) and one model 105 ("standard" system). Two systems are planned for installation the summer of 1999: Buffalo and Providence.

THE RESIDENT CLASSES FOR FY99 ARE LISTED ABOVE IN THE SCHEDULE. Be sure to take the CBI as soon as possible in preparation for these resident classes at the Academy.

FAALC is now supporting the system.

A prototype EFGS called End Fire Upslope was installed at Columbus, GA last winter, optimization is on going and upon completion the system will be tested during the next year. The term "upslope' is used to describe the systems capability to perform well in the presence of rising terrain under the approach path. This is accomplished by the addition of the middle antenna and the capability to adjust its amplitude and phase to cancel low angle radiation on the offending surfaces.

Regional Interest:

The FAA Academy has developed a CBI course (No. 47709/CBI) of 25 hours duration and a Resident "Hot Lab" course (No. 47709) of 3 days duration. The Academy will provide all necessary documentation and training material for these courses.

An updated technical manual has been distributed. The NSN for the instruction book (TI 6750.186) is 0056-00-480-03 16.

The Program Office purchased 8 EFGS Antenna Systems (six Model 106, TYPE FA 10029A and two Model 105 TYPE FA 10029).

EFGS Systems:

"Standard" System (previous procurement)

Model 105/TYPE FA 10029

TI6750.162

"Short" Stystem* (present procurement)

Model 106/TYPE FA 10029A

TI 6750.186 (includes Model 105)

DISTRIBUTION

AAF-I/I 1
AAL-400/421C/421 D/510/61O/DARR
AAR-1
AAT-1/4/5/6/7/8
ACD-1 10/330
ACE-/400/424/425/600/DARR
ACT-1 /200/300
AEA-400/600/630
AFR-1 /100/200/300
AFS-12/400
AFZ-200
AGL-400/420/450/459.4/470/500/600
ALM-1 /100/200/400/140/600/
ALW-200
AMA-200/400/434/500/600
AMC-1
AML-130/200/400/460/461/600B/642
AND-I /10/20/30/100/200/300/400/500/600
ANE-400/422/422GC/452J/600/900Mil Reps
ANM-400/600/902/900
ANS-1/420
AOS-100/200/240
APP-1
ARA-1
ASA-304
ASD-1/7/110/300/31O/400/500
ASO-400/600/900/91O/920/930
ASU-1/200/300/310/350
ASW-400/600/900/91O/920/930
ATA-1
ATC-D
ATM-I
ATO-1
ATP-1
ATR-1 /100/200/300/400/
ATX-1
ATZ-1
AVN-1/300
AVR-10
AWP-400/422.21/460SP/ 600/91O/920/930
All Airway System Maintenance Managers

CNO (OP-554)
COMNAVAIRLANT(N371)
DOD (SAF/RL)
HQ USAF/XOOB
NAVAIR (AIR-551 5)
NAVAIR (PMA-213)
NCCOSC

SAF/AQPC/RL
USA AVCCOM (AMCPM-ATC-DR)
USAAVNC/ATZQ-ATC-DR
USAAVSCOM/AMCPM-ATC
USAF (AF/XOOSA)
USAF (ESD/TG)
USAF (SM-ALC/LH FBA)
USAF Flight Standards (AF/XR)
HQ USAFE/SCMB

AB Management Assoc.
ARINC
ATS Inc
Aviation Management
Bond & Associates
Canada Marconi
CMC Electronics
CRM
CTA
DI
DME Corporation
HFS
Interscan Int., Ltd.
JIL
Micronav International, Inc.
Mitre Corp.
NavCom
NBP
Ohio University
Pragmatics
R.W. Armstrong Co.
Rannock
Raytheon
Roselm Ind.
RSI
SAIC
SRC

ICAO Representatives

Australia
Canada
France
Germany
Italy
Japan
Russia, CIS
Sweden
The Netherlands
United Kingdom

PRODUCT TEAM

NAVIGATION AND LANDING PROGRAM, AND-740

PRODUCT LEAD (Acting)	STEVE WOLF, AND-740	493459
DEPUTY PRODUCT LEAD	STEVE WOLF, AND-740	493-4559
BUSINESS MANAGER	MARYANNE AUSTIN, AND-740	493-4752
SECRETARY	MONIQUE LANCE, AND-740	493-4748
PROGRAM ANALYST (LANDING)	VONYA BROWN, AND-740	4934754
PROGRAM ANALYST (NAVIGATION)	BRENDA SULLIVAN, AND-740	493-4677
PROJECT ENGINEERS		
NAVIGATION & LANDING	MITCH NARINS, AND-740	493-4336
ELECTRONICS LEAD		
CAPTURE EFFECT KITS	MIKE FLYNN, AND-740	493-4758
ILS-ARMS	MIKE RIVERS, AND-740	493-4766
ILS SLEP	MIKE RIVERS, AND-740	493-4766
	MIKE FLYNN, AND-740	493-4758
ILS-MARK 20	WM. McPARTLAND, AND-740	493-4762
	GREG RUGILA, AND-740	493-4768
RVR	DEBORAH LUCAS, AND 740	493-4761
	GREG RUGILA, AND-740	4934768
EFGS	DEBORAH LUCAS, AND-740	493-4761
MLS CAT I (FAR-171)	GARY RIXMANN, AND-740	493-4767
OHIO UNIVERSITY	MIKE FLYNN, AND-740	493-4758
NON-FEDERAL	CALVIN MILES, AND-740	493-4763
LIGHTING LEAD	LANSINE TOURE AND-740	493-4771
RRCIU, PAPI	SANDRA STEWART, AND-740	493-4770
MALSR, RRCS, REILS	SETH COUSLAR, AND-740	493-4756
VOR/DME, APPROACH		
LIGHTING R&D, RMVC, TLS	CHARLES BEAM, AND-740	493-4793
TACAN, COTS DME, VHF-DF,	GREG RUGILA AND-740	493-4768
ALSF-2, NDB, DVOR, VOT	BILLY NESMITH, AND-740	493-4764
LORAN, Non-Fed ILS	WM. McPARTLAND, AND-740	493-4762
CONTRACTING (ILS)	SANDY HARRELSON, ASU-310	4934734
CONTRACTING (MLSNISUALS)	MATTHEW ASAI, ASU-310	493-4751
CONTRACTING (MALSR) EFGS, RRCIU, PAPI	DIANE DAVIS, ASU-310	4934757
CONTRACTING (RVR)	CHERY EMERSON-ADAMS	493-4700
CONTRACTING (SLEP)	KATHERINE WHITE, ASU-310	493-4773

All telephone numbers are Area Code 202 unless otherwise indicated.

PRODUCT TEAM (Contd.)

NAVIGATION AND LANDING PROGRAM, AND-740

CONTRACTING (SLEP 3B)	STELLA CLARY, ASU-310	493-4755
CONTRACTING (TACAN)	VICKIE GORDON, ASU-310	493-4759
LOGISTICS	FRANK PATRICK, ARN-200	493-0697
TESTING (RVR)	BILL BENNER, ACW-200B	(609)485-4033
TESTING (ILG)	JACK TOWNSEND, ACD-330	(606)485-4579
TESTING (NAV)	BOB ERIKSON ACT-360	(609)485-5750
QUALITY (ILS MLS-WILCOX, COTS DME-ASII)	MARK SAULET, ASU-240	(816)452-0418 (913)492-1189
QUALITY (RVR)	WILBERT BENTLEY	(310)442-4253
QUALITY (ALSF-2)	MIKE SMITH	(909)982-9806x256
QUALITY (EFGS)	FRANK BACHELOR	(301)640-3879
QUALITY (HQ)	JOHN SEGER	267-9713
QUALITY (MIL-BENDIX)	DERRICK KNIGHT, ASU-240	(410)583-4108
NAS TRANSITION	STEVE KENT, ANS-700	358-5282
REQUIREMENTS (NAV)	TREVOR HENRY, ARN-200	493-4760
REQUIREMENTS (LANDING)	BOB HODGES, AFR-303	267-8292
AIR TRAFFIC PROCEDURES (DF)	BOB GERAMIS, ATP-I IO	367-9326
AIR TRAFFIC PROCEDURES	C. R. BRAMBLE, ATP-126	267-9343
RESEARCH & DEVELOPMENT	DON GALLAGHER, AAR-410	(609)485-4583
SYSTEMS ENGINEERING	DAVE OLSEN, ASD-120	35815440
LEGAL	SYBIL HOROWITZ	267-3184
FLIGHT STANDARDS	PAUL BEST, AFS-420	267-8372
FLIGHT CERTIFICATION	FRANK ROCK, AIR-I 20	267-9567
CONFIGURATION MANAGEMENT	Anaya Jamison, Marconi	484-4430
CONFIGURATION MANAGEMENT	Denise Glover, Marconi	484-2586

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